



Exact Solutions > Functional Equations > Nonlinear Functional Equations with Several Independent Variables > Power-Law Cauchy Equation

2. $f(xy) = f(x)f(y)$.

Power-law Cauchy equation.

Solution:

$$f(x) = x^C,$$

where C is an arbitrary constant. Furthermore, the function $f(x) \equiv 0$ is also a solution.

References

- Fikhtengol'ts, G. M.**, *A Course of Differential and Integral Calculus, Vol. 1* [in Russian], Nauka, Moscow, 1969 (page 160).
Aczél, J. and Dhombres, J., *Functional Equations in Several Variables*, Cambridge Univ. Press, Cambridge, 1989.
Polyanin, A. D. and Manzhirov, A. V., *Handbook of Integral Equations: Exact Solutions (Supplement. Some Functional Equations)* [in Russian], Faktorial, Moscow, 1998.

Power-Law Cauchy Equation